

IN THE CLAIMS:

Claims 1-52 (canceled).

Claim 53 (withdrawn/currently amended) An isolated nucleic acid fragment encoding a putative protective antigen against Mycoplasma hyopneumoniae Mycoplasma hyopneumoniae or related infections, said nucleic acid fragment including the following sequence, mutants, derivatives, recombinants and fragments thereof;

10 1234567890	20 1234567890	30 1234567890	40 1234567890	50 1234567890	
ATGAAAAAAA	TGCCACTATA	CCAGAGGGAAA	GAGCAGTATA	TAATAAATT	50
AAAATTACAT	TTCTTCATT	TGCGCCAGAA	TTTTAAGAA	TTAGTACATT	100
AAAAAGTAGA	ACAAAAGTTA	TTAATGTAAA	CATTAGCGCA	ATCCTTAAGA	150
AAAAATTAAA	AGTTTATCT	ATTTTTTA	ATCGAAATCC	AACCAGGCAT	200
AAATCTTTGT	CAGTATTTAT	CAAGTCGGTA	TTTTTCATT	ATTTCTACTA	250
AAATATTATT	TGAATTGCA	TTTCCATAA	TCTAAAATT	TACATTTTT	300
TATAACAATT	TTTAAAATT	ACTCTTTAAT	TTATAGTATT	TTTTTATTTT	350
TTAGTCTAAA	TTATAAAAATT	ATCTGAATT	TTATTTGAAT	TTTTATAAATT	400
TAGTACTAAA	AAATACAAAT	ATTTTTCCCT	ATTCTAAGAA	AAATTCAATT	450
TTTAAAAAAA	ATTGATTTT	ATAGTATAAT	TTGTTTGAT	AATTGAATT	500
ACTTGATTTG	AAAGGGAAACA	AAATGAAAAAA	AATGCTTAGA	AAAAAATTCT	550
TGTATTTCATC	AGCTTTTAT	GCAACTTCGC	TTGCATCAAT	TATGCATT	600
GTTGCAGCAG	GTTGTTGGACA	GACAGAAC	GGTTCAACTT	CTGATTCTAA	650
ACCACAAGCC	GAGACGCTAA	AACATAAAGT	AAGTAATGAT	TCTATTGAA	700
TAGCACTAAC	CGATCCGGAT	AATCCTCGAT	GAATTAGTGC	CCAAAAAGAT	750
ATTATTTCTT	ATGTTGATGA	AACAGAGGC	GCAACTTCAA	CAATTACAAA	800
AAACCAGGAT	GCACAAAATA	ACTGACTCAC	TCAGCAAGCT	AATTAAAGCC	850
CAGCGCCAAA	AGGATTATT	ATTGCCCTG	AAAATGGAAG	TGGAGTTGGA	900
ACTGCTGTTA	ATACAATTGC	TGATAAAGGA	ATTCCGATTG	TTGCCTATGA	950
TCGACTAATT	ACTGGATCTG	ATAAAATATGA	TTGGTATGTT	TCTTTGATA	1000
ATGAAAAAGT	TGGTGAATTA	CAAGGGCTTT	CACTGCTGC	GGGTCTATTA	1050
GGAAAAGAAG	ATGGTGCTTT	TGATTCAATT	GATCAAATGA	ATGAATATCT	1100
AAAATCACAT	ATGCCCAAG	AGACAATTTC	TTTTATAAC	ATCGCGGGTT	1150
CCCAAGATGA	TAATAATTCC	CAATTTTTT	ATAATGGTGC	AATGAAAGTA	1200
CTTAAAGAAT	TAATGAAAAA	TTCGAAAAAT	AAAATAATTG	ATTTATCTCC	1250
TGAAGGCGAA	AATGCTGTTT	ATGTCCCAGG	ATGAAATTAT	GGAACTGCCG	1300
GTCAAAGAAT	CCAATCTTTT	CTAACATTAA	ACAAAGATCC	AGCAGGTTGGT	1350
AATAAAATCA	AAGCTGTTGG	TTCAAAACCA	GCTTCTATT	TCAAAGGATT	1400
TCTTGCCCCA	AATGATGGAA	TGGCCGAACA	AGCAATCACC	AAATTAAAAC	1450
TTGAAGGGTT	TGATAACCAA	AAAATCTTTG	TAACTCGTCA	AGATTATAAT	1500
GATAAGCCA	AAACTTTTAT	CAAAGACGGC	GATCAAATAA	TGACAATTAA	1550
TAAACCTGAT	AAAGTTTAG	AAAAAGTTGC	TGTTGAAGTT	CTTCGGGTTT	1600
TAATTGCAAA	AAAAAATAAA	GCATCTAGAT	CAGAAGTCGA	AAACGAACTA	1650
AAAGCAAAAC	TACCAATAT	TTCAATTAA	TATGATAATC	AAACATATAA	1700
AGTACAAGGT	AAAAATATTA	ATAAAATT	AGTAAGTCGA	GTAATTGTTA	1750
CAAAAGCTAA	TGTTGATAAT	CCTGATGCCT	AA		1782

Claim 54 (withdrawn/currently amended) A method for producing an antibody against a Mycoplasma Mycoplasma including providing a biological sample taken a short time after an immune animal has been challenged with a Mycoplasma Mycoplasma or Mycoplasma Mycoplasma extract taken from the infection site or an area of a lesion or an area close to the infection site or lesion:

isolating cells from the biological sample;
culturing cells in-vitro in vitro in a suitable culture medium; and
harvesting antibodies produced from said cells.

Claim 55 (withdrawn/currently amended) A method according to claim 54 wherein the biological sample is taken approximately 2 to 7 days after the animal has been challenged with the Mycoplasma Mycoplasma.

Claim 56 (withdrawn/currently amended) A method according to claim 55 wherein the culturing of cells in-vitro in vitro further includes addition of helper factors to the culture, said helper factors selected from the group including cytokines used alone or in combination, including interleukin 1, 2, ,3, 4, 5, 6, 7 and 8, colony stimulating factors, interferons and any other factors that may be shown to have an enhancing effect on specific B cell secretion.

Claim 57 (withdrawn) A method according to claim 56 further including a cell activation step including activating the cells isolated to proliferate and secrete and/or release antibodies, said cell activation step including adding a cell activating agent to

the culture medium, said cell activating agent selected from the group including mitogens and helper factors produced by leukocytes, or their synthetic equivalents or combinations thereof.

Claim 58 (withdrawn) A method according to claim 57 wherein the antibody is in the form of the supernatant harvested from the culture medium.

Claim 59 (withdrawn/currently amended) An antibody against a Mycoplasma Mycoplasma prepared according to the method of claim 54.

Claims 60- 66 (cancelled)

Claim 67 (withdrawn/currently amended) A vaccine or veterinary composition including an antibody against a Mycoplasma Mycoplasma according to claim 59.

Claims 68-69 (cancelled)

Claim 70 (withdrawn/currently amended) An isolated DNA fragment encoding a putative protective antigen against Mycoplasma Mycoplasma or related infections, said DNA fragment having a nucleic acid sequence according to Figure 6 or an homologous sequence, and functionally active fragments, mutants, variants or recombinants thereof.

Claim 71 (withdrawn) A clone including a DNA fragment according to claim 70.

Claim 72 (withdrawn) A clone according to claim 71 which is clone pC1-2.

Claims 73 - 74 (cancelled)

Claim 75 (currently amended) An isolated antigen prepared by a method comprising:

- (a) providing a sample of a *Mycoplasma*,
- (b) providing an antibody probe including at least one antibody against the *Mycoplasma*, said at least one antibody being produced by a method comprising
 - (i) providing a biological sample taken ~~a short time after a mammal has been challenged with the *Mycoplasma* or an extract comprising the *Mycoplasma* at an infection or lesion site, said biological sample being taken from the infection or lesion site or an area close to the infection or lesion site, wherein the biological sample is taken from the mammal within about 2 to 5 days after the mammal has been challenged with the *Mycoplasma* or extract;~~
 - (ii) isolating antibody producing cells from the biological sample;
 - (iii) culturing the isolated cells *in vitro* in suitable culture medium; and
 - (iv) harvesting the at least one antibody from said cultured cells;
 - (c) probing the *Mycoplasma* sample with the antibody probe to detect at least one antigen; and
 - (d) isolating the at least one antigen detected.

Claim 76 (currently amended) An isolated antigen comprising a molecular structure that is identifiable with an antibody probe produced by harvesting an antibody from antibody producing cells of a mammal that are at or close to an infection or lesion site within 2 to 5 days after said mammal is challenged by infection with *Mycoplasma hyopneumoniae* at said infection or lesion site, said molecular structure being a native *Mycoplasma hyopneumoniae* antigen having an approximate molecular weight in kilodaltons (kD) of between 110 - 114, 90 - 94, 72 - 75, 52 -54 or 46 - 48, or being a mutant, derivative or fragment of the native antigen that stimulates production of the antibody in the antibody producing cells, wherein if the molecular structure is the native antigen having the molecular weight between 72 - 75 kD, the molecular structure contains an N-terminal amino acid sequence comprising SEQ ID NO:12, and wherein if the molecular structure has a molecular weight between 46 - 48 kD, the molecular structure has an N-terminal amino acid sequence comprising SEQ ID NO:3.

Claim 77 (previously presented) An isolated antigen according to claim 76, wherein the molecular structure comprises the N-terminal amino acid sequence comprising SEQ ID NO:12.

Claim 78 (previously presented) An isolated antigen according to claim 77, comprising at least one internal amino acid sequence selected from the group consisting of SEQ ID NO13; SEQ ID NO:14 and SEQ ID NO:15.

Claim 79 (previously presented) An isolated antigen according to claim 76, wherein the molecular structure has a molecular weight between 60 - 64 kD and has an N-

terminal amino acid sequence comprising SEQ ID NO:10 or SEQ ID NO:11.

Claim 80 (previously presented) An isolated antigen according to claim 76, wherein the molecular structure has a molecular weight between 52 - 54 kD and has an N-terminal amino acid sequence comprising SEQ ID NO:7.

Claim 81 (previously presented) An isolated antigen according to claim 80, comprising at least one internal amino acid sequence selected from the group consisting of SEQ ID NO:8 and SEQ ID NO:9.

Claim 82 (previously presented) An isolated antigen according to claim 76, wherein the molecular structure has a molecular weight between 46 - 48 DK and has an N-terminal amino acid sequence comprising SEQ ID NO:3.

Claim 83 (previously presented) An isolated antigen according to claim 82, comprising at least one internal amino acid sequence from the group consisting of SEQ ID NO:4; SEQ ID NO:5 and SEQ ID NO:6.

Claims 84 and 85 (cancelled)

Claim 86 (currently amended) A method for preparing a synthetic antigenic polypeptide against *Mycoplasma*, which method comprises

- (a) providing a cDNA library or genomic library derived from a sample of the *Mycoplasma*;

- (b) providing an antibody probe produced by
- (i) providing a biological sample taken ~~a short time after a~~ mammal has been challenged with the *Mycoplasma* or an extract comprising the *Mycoplasma* at an infection or lesion site, said biological sample being taken from the infection or lesion site or an area close to the infection or lesion site, wherein the biological sample is taken from the mammal within about 2 to 5 days after the mammal has been challenged with the Mycoplasma or extract;
- (ii) isolating antibody producing cells from the biological sample;
- (iii) culturing the isolated cells *in vitro* in a suitable culture medium;
- and
- (iv) harvesting at least one antibody from said isolated cells;
- (c) generating synthetic polypeptides from the cDNA library or genomic library;
- (d) probing the synthetic polypeptides with the antibody probe to detect the synthetic antigenic polypeptide; and
- (e) isolating the synthetic antigenic polypeptide detected thereby.

Claim 87 (previously presented) A method according to claim 86, wherein the at least one antibody is raised against an antigen from *Mycoplasma hyopneumoniae* or a related organism, said antigen being selected from the group of native *Mycoplasma* antigens having approximate molecular weights of 110 - 114, 90 - 94, 72 - 75, 52 - 54 and 46 - 48 kilodaltons (kD) or being a mutant, derivative or fragment of a native

Mycoplasma antigen that stimulates production of the at least one antibody in said mammal.

Claim 88 (previously presented) A synthetic antigen produced by the method of claim 86.

Claim 89 (previously presented) A vaccine or veterinary composition comprising a prophylactically effective amount of at least one antigen according to claim 76.

Claim 90 (previously presented) A vaccine or veterinary composition comprising prophylactically effective amounts of a plurality of antigens according to claim 76.

Claim 91 (previously presented) A diagnostic kit including an antigen according to claim 76.

Claim 92 (previously presented) A method for preventing or treating *Mycoplasma* infection, which method comprises administering to a mammal a prophylactically or therapeutically effective amount of at least one antigen according to claim 76.

Claim 93 (currently amended) An amino acid sequence encoded by a SEQ ID NO:1
~~or a functional equivalent of said amino acid sequence.~~

Claim 94 (currently amended) An amino acid sequence consisting of SEQ ID NO:2

~~or a functional equivalent of said amino acid sequence.~~

Claims 95 - 98 (cancelled)